



STEM2Stern

**2014
FALL**
NEWSLETTER

HELLO
my name is

Intern

The Internship Edition



Read a firsthand perspective on the impact of naval internships

Student Spotlight

Meet four naval interns from across the country and learn about their experience working side-by-side with naval scientists and engineers



High school students learn to program in C++ and assemble mini super computers



MESSAGE FROM THE NAVAL STEM EXECUTIVE

One of the many things that sets the Navy and Marine Corps apart when it comes to choosing a career is the ability to truly make a difference. Our Sailors, Marines and civilians contribute to their country every day in countless ways—that certainly includes creating and using new innovative technologies that ultimately improve and secure our American way of life.

In our naval labs and warfare centers across the country, scientists and engineers work closely with our warfighters and policy leaders in an ongoing, well-understood, shared mission: Keep our people safe and enable their missions. It's a simple, clear responsibility, and it requires the best and the brightest from across the workforce.

How can we make sure we're getting the students that we want and need into the

naval future force? The Department of the Navy is well aware that graduating students have many options for careers. Therefore, the Navy has established valuable internships and fellowships to showcase the many programs we are working on. Not only do we benefit from the ideas and energy of student interns, but through these programs, we're able to bring them into contact with the most cutting-edge research and technology.

Some of the programs our scientists and engineers are working on today include the invaluable contributions of interns each step of the way and involve research or technology once considered fantasy or science fiction. Together, we are bringing once unbelievable ideas to reality.

Nelson Mandela stated: "It always seems impossible until it is done." In that spirit, we need bright minds to support bright visions.

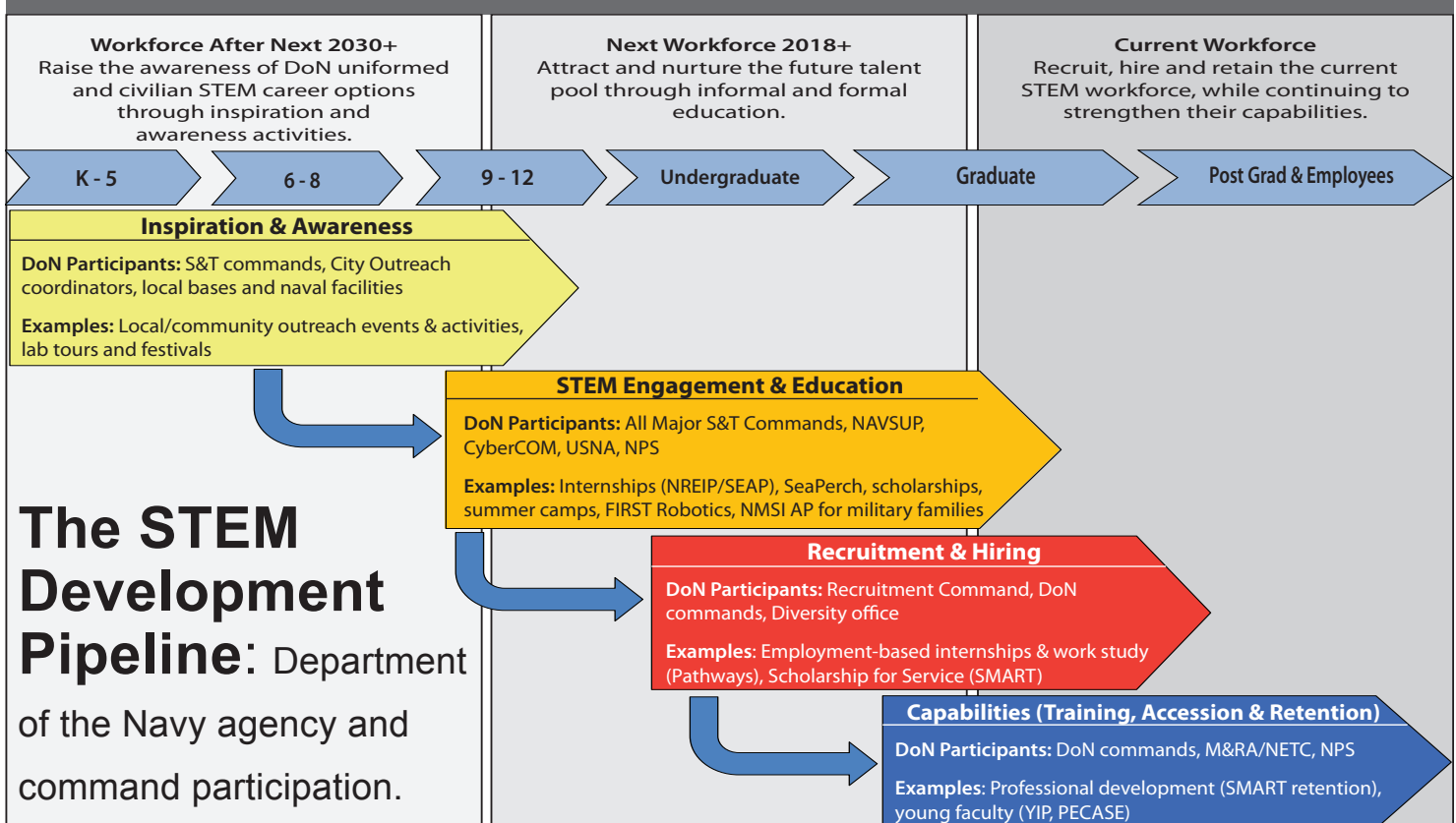
As I prepare to retire from the U.S. Navy, including the position of chief of naval research and naval STEM executive, I

want to sincerely thank all of you for your efforts to encourage new generations of scientists and engineers. I have been repeatedly inspired seeing the talent of the students we work with. It is our responsibility in the Navy and Marine Corps family to foster the professional and technical growth of these students, and to provide the mentorship that guides them on their respective paths. Success for our Sailors and Marines begins and ends with us, and we will continue to deliver the best we have to them and their fellows.

Thank you for the constant support and leadership in our critical mission. It has truly been an honor to serve beside you.

Sincerely,

Matthew L. Klunder
Rear Admiral, U.S. Navy
Chief of Naval Research
Naval STEM Executive



ENGAGING OUR INTERNS: A PROGRAM MANAGEMENT PERSPECTIVE

BY REGGIE WILLIAMS, OFFICE OF NAVAL RESEARCH

We all grow up being told that it is important to be prepared. In fact, we often hear that preparation is the key to success, and there is no better way to prepare to enter the workforce than to participate in internship programs. The Office of Naval Research supports two internship programs that offer incredible value to the Navy, Marine Corps and participating students: the Naval Research Enterprise Internship Program (NREIP) and the Science and Engineering Apprenticeship Program (SEAP).

Interns participating in these programs spend time working side-by-side with their peers and experienced scientists and engineers at naval laboratories and warfare centers across the nation. For some, this opportunity is the beginning of a long-term mentorship.

The most rewarding part for me, as the SEAP and NREIP program manager, is to see the number of students participating in real-world science and technology. For many, this is their first experience with what scientists and engineers actually do, and these engagements have a long-term impact. These internships

help expose a new generation of students to science and engineering and provide the opportunity for college students to put their hard-earned academic skills to work.



However, the internship programs do not only benefit the students—mentors also can find value if they are fully engaged with the interns. My advice to anyone interested in mentoring is to make themselves truly available during the eight- or 10-week summer term and have a willingness to share skills, knowledge and experiences. Also, a mentor should take a personal interest in the intern's professional growth, showing a willingness to provide technical and personal guidance, balanced feedback and encouragement. If you do all of this, the NREIP and SEAP experience will be rewarding for you and your mentee.

THE TRANSFORMATIVE POWER OF INTERNSHIPS

BY LCDR LEEDJIA SVEC, DEFENSE EQUAL OPPORTUNITY MANAGEMENT INSTITUTE

Internship \ in'tern•ship \ n. : any official or formal program to provide practical experience for beginners in an occupation or profession—dictionary.com

I am certain that the above definition does not capture the full spectrum of positive impact that internships provide. Internships play a vital role for those preparing to enter the workforce. From students, to mentors, to commands, there is a transformative power that these programs enable. I have been fortunate to work as an intern, a mentor and an internship coordinator at the command level, so I have seen the impact these programs have at all levels of participation.

As an intern, I will never forget how my mentor requested I add mathematical modeling to a Laser Eye Protection project. Although I had never done math modeling before, I had greater confidence in my capability because I knew that my mentor believed in me. I engaged in math modeling and enjoy it to this day. Sometimes a simple statement can provide someone with confidence to go in directions they did not know were possible.

As a mentor, it is a fantastic experience to see mentees grow—from fearfulness to confidence, from uncertainty of graduation to achieving advanced degrees. As students receive the positive

messages that internships provide, they mentor other students in turn, creating a ripple effect of positive impact and influence. Mentoring also teaches one how to be a leader and develops skills that cannot be learned in any classroom.

At the command level, the benefit extends beyond contribution to the mission. The contagious energy that interns bring reminds one of the joys of science and discovery. Their positive attitude adds a vibe to the climate from which everyone, no matter their occupation, benefits. Internships also enable leadership opportunities for command staff, from logistics to outreach, locally and nationally.

Internships do more than teach occupational skills; they spark life-changing experiences for students and staff. Whether you provide a single statement of encouragement to an interested student, engage in a supporting role or implement a STEM program, internships have the power to transform and ignite dreams beyond imagination.

The Defense Equal Opportunity Management Institute (DEOMI) offers equal opportunity/equal employment opportunity education and training for active duty military, reservists and civilian personnel. DEOMI is located in Brevard County, Florida.

STUDENT Spotlights

Science and Engineering Apprenticeship Program (SEAP)

SEAP is an eight-week high school summer apprenticeship opportunity at a naval laboratory or warfare center. Selected applicants work under the guidance of a mentor conducting naval-relevant research at one of nearly 25 sites across the country.

Name: Ashley Winans

School: Mississippi State University

Grade: Freshman

Location of Internship: Naval Research Laboratory, Stennis Space Center, Mississippi

Mentor's Name: Allison Penko, Ph.D., coastal engineer

Branch: Sediments Dynamics Section/ Seafloor Sciences Branch / Marine Geosciences Division



How did you become interested in STEM?

Math and science have always come easy to me. I enjoy working mathematic problems like a puzzle and exploring something new in a laboratory. I became aware of this SEAP opportunity through a discussion with one of my high school teachers.

What was the best part of your internship?

I really enjoyed being in a laboratory and taking part of a real experiment. I was able to work hands-on with my environment and learned many helpful tips. Through this internship I experienced a work environment and learned what is expected of me as an employee. It allowed me to grow into a more responsible person and it helped pay for my education.

What's next for you?

I plan to continue my education at Mississippi State University. Upon receiving my bachelor degree in mechanical engineering I hope to find employment and become a contributing member of the workforce.

NAVAL RESEARCH ENTERPRISE INTERNSHIP PROGRAM (NREIP)

NREIP is a 10-week undergraduate and graduate summer research internship opportunity at a naval laboratory or warfare center. Selected applicants work under the guidance of a mentor conducting naval-relevant research at one of nearly 30 sites across the country.

Name: Turner Meeks

School: Washington and Lee University

Grade: Senior

Location of Internship: Naval Surface Warfare Center, Carderock, Bethesda, Maryland

Mentor's Name: Phil McCormick, Cost Team Lead

Branch: Cost Effectiveness Branch

How did you become interested in STEM?

As long as I can remember, I have found great joy and excitement in my math classes, which ultimately led me to pursue a degree in mathematics. The skills developed while studying mathematics, from problem solving to abstract thinking, can be applied to virtually any field, and I was drawn to that universal appeal.



What was the best part of your internship?

The best part of my internship was working on projects with experienced cost analysts and giving briefs to Senior Executive Service management. The experience proved invaluable, as I learned to condense extensive analytical work into a cohesive presentation.

What's next for you?

As a 2014 Science, Mathematics and Research for Transformation Scholarship recipient I will return to the Cost Effectiveness Branch at Carderock upon graduation next spring. Once there, I will enroll in the Scientist/Engineering Development Program, a three-year program that provides training and mentoring.

COOPERATIVE EDUCATION PROGRAM (CO-OP)

CO-OPs are offered at a variety of naval laboratories and warfare centers and vary from site to site. These programs provide the opportunity for students to gain practical job skills while working with, or under the guidance of, experienced personnel through alternating or parallel periods of academic study and career-oriented employment.

Name: Victoria Thacher

School: University of Vermont

Degree Level: Bachelor of Science, Mechanical Engineering

Location of Internship: Portsmouth Naval Shipyard, Kittery, Maine

Mentor's Name: Too many to name!

Branch: Test Engineering

How did you become interested in STEM?

I became interested in a STEM internship because the jobs being offered seemed like they could teach me things about engineering that I couldn't learn in a classroom. My internship rounded out my education and better prepared me for a career in the mechanical world. In addition to the learning opportunities, the STEM program paid really well and offered other benefits I couldn't find elsewhere.



What was the best part of your internship?

My internship was mainly focused on learning. Submarines are complex! Without the in depth system knowledge required to run tests, it was often hard to contribute. Therefore, I spent a lot of time researching, reading and talking with other employees to learn. In between studies, I was able to spend a good amount of time on the boats helping out with tests any way I could. Testing was my favorite part of the job because it gave me a chance to be active!

What's next for you?

About a year before I graduated, my department offered me a full time position, which I accepted. Right now I am in the middle of a lengthy training program. My role at the shipyard will be to assist in the test program that each submarine goes through before being allowed back out to sea. I'd also like to take some graduate-level courses and possibly get a master's degree.

SCIENCE, MATHEMATICS & RESEARCH FOR TRANSFORMATION (SMART)

SMART offers scholarships to undergraduate, graduate, and doctoral students who have demonstrated ability and special aptitude for training STEM fields. The DoD also offers career opportunities for students to continue their research as civilian employees at a DoD laboratory after graduation.

Name: Dr. Travis Axtell

School: Naval Postgraduate School

Degree Level: Doctorate

Location of Internship: SPAWAR Atlantic, Charleston, South Carolina

Mentor's Name: Norris C. Mitchell

Branch: Engineering Competency

How did you become interested in STEM?

My interest in STEM began with computers; I started using them when I was three years old. At 12, I started teaching myself programming and kept going from there. There were no significant Internet references or mentors to assist, so my learning involved a lot more failures than successes. As a result of those hurdles, I decided to help fix the same problems that I experienced as a child.



What was the best part of your scholarship?

As a SMART scholarship recipient, I mentored to give back to the community since my education was paid for by the public through the program. I enjoyed mentoring local FIRST robotics teams. In fact, three of my teams participated in the international FIRST Championship.

What's next for you?

I'm currently an engineer in the Navy space cadre that is working towards advancing naval information dominance. I hope to continue my involvement with FIRST robotics—I am very proud that my students build the robots rather than the adult mentors. I also keep in touch with many of my former students who have started their own careers, including within the Department of Defense, and are now directly contributing to the success and readiness of the fleet.



COLLEGE BOUND: Grace Young has cultivated a love of science and engineering through several years of mentorship and an internship at SPAWAR. (Photo courtesy of Grace Young)

SPAWAR

PROGRAM CULTIVATES NEEDED SKILLS AND INTEREST IN STEM

BY BRAD GRAVES, SAN DIEGO BUSINESS JOURNAL

Alliance program that introduces young women to science and engineering. She landed an internship last summer at SPAWAR, where mentors steered her toward image processing.

The Navy, which has time-saving algorithms to help analysts review satellite images and pick out ships, is working on technology to interpret video. Toward that effort, Young was asked to teach the computer to find the horizon in a video feed. Earlier this year, at a security conference in Baltimore, Young presented her solution to the scientific community in a poster session titled "Robust real-time horizon detection in full-motion video."

Young recalled that at the end of her internship, her mentor asked if anyone else had done what she had accomplished. Her answer was no. That's when her supervisor uttered seven words: "You know you could patent this, right?"

Soon she was sitting with SPAWAR's patent staff working on a patent application. SPAWAR will share her patent once it is issued.

Young is one of many young people that

SPAWAR employees have mentored through its K-12 outreach program, coordinated by Jim Rohr, a SPAWAR engineer and physicist. The program has grown from a single event in 2007 to more than 300, with volunteers giving more than 12,000 hours in the community, said Rohr.

Rohr sees imagination and curiosity in the students he meets in the community, but he laments that those traits seem to diminish as they progress through school. A key challenge is how to keep students engaged and excited about science and technology—and the SPAWAR outreach program is doing just that.

As for Young, her SPAWAR experience continues to reap benefits. College admissions officers at numerous top ranked universities were impressed with her application. In the end, Stanford University won out and she will pursue her next engineering challenge there.

This is an excerpt from the Brad Graves article, "For SPAWAR, 'Readiness' Also Includes Educational Outreach." The article originally appeared on the San Diego Business Journal website at <http://www.sdbj.com>.

SPAWAR is an economic powerhouse that's poised to send \$1.77 billion into the local economy this year. But its impact is about more than dollars and cents. Young's achievement is a classic example of SPAWAR's particular positive influence on local primary and secondary school science learners.

Young has interacted with SPAWAR's volunteer corps—estimated at 400 technical experts—since the seventh grade. That's when she started participating in a San Diego Science

THREE QUESTIONS WITH GRACE YOUNG

How did you become interested in STEM? As a child, I had a fascination with how the world worked. My parents encouraged my interest by enrolling me in elementary and middle school STEM programs. As a third grader attending a NASA Academy, I interviewed experts about the downgrading of Pluto. In sixth grade, I joined my first robotics team. In seventh grade I entered a program called BEWiSE, Better Education for Women in Science and Engineering. Through middle and high school I attended workshops, met women STEM mentors and completed engineering team projects. I actually heard about SPAWAR's Science and Engineering Apprenticeship Program internship program through BEWiSE!

What was the best part of your internship? The best part of my internship, both this summer and last, was working in an environment in which the people around me were passionate and knowledgeable about their work. I enjoyed working on a project that I felt was practical and beneficial to the Navy.

What's next for you? I just finished a second internship at SPAWAR, where I worked on assigning a mode of transportation to GPS coordinates. I'm starting school this fall, and I've been looking at taking chemistry, math, physics—all of my engineering fundamentals—and a cryptography class! I feel very lucky.

PHDs AND POLKA DOTS? HOW NPS IS WORKING TO CLOSE THE STEM GENDER GAP

BY MASS
COMMUNICATION
SPECIALIST 2ND CLASS
DANICA SIRMANS, NAVAL
POSTGRADUATE SCHOOL



WOMEN IN STEM: NPS hosts the annual Ph.D.s + Polka Dots at the Roman Plunge Reflecting Pool. NPS faculty Drs. Eva Regnier and Deborah Goshorn and NPS graduate student Marine Corps Maj. Keystella Mitchell met with the female STEM interns for a networking and mentorship opportunity, designed to encourage the students' continued pursuit of STEM careers. (U.S. Navy photo by Mass Communication Specialist 2nd Class Danica Sirmans)

It's no secret that women are historically underrepresented in the STEM disciplines, and mentorship is a frequent focal point for potential solutions. It's with this notion that Naval Postgraduate School's (NPS) STEM internship coordinator, Alison Kerr, organized the annual Ph.D.s + Polka Dots gathering.

"The importance of role models cannot be stressed enough for young people, particularly for those who don't see themselves mirrored in the STEM workforce," said Kerr.

NPS hosted the annual Ph.D.s + Polka Dots event on July 10. NPS faculty Dr. Eva Regnier and Dr. Deborah Goshorn and NPS graduate student Marine Corps Maj. Keystella Mitchell met with the female STEM interns for a networking and mentorship opportunity designed to encourage the students' continued pursuit of STEM careers.

Kerr welcomed the campus' 24 female high school, community college and university summer interns to convene with two NPS female faculty, Defense Resources Management Institute associate professor Dr. Eva Regnier and Dr. Deborah Goshorn, assistant professor in the Electrical and Computer Engineering Department. Rounding out the mentor team was information sciences graduate student Marine Corps Maj. Keystella Mitchell.

Goshorn shared her experience with adversity and emphasized the importance of resilience and perseverance. "You'll have unique academic and career experiences that will be full of ups and downs, but realize the downs are temporary," she said. "Always look to the horizon because those peaks will be there even if they seem to be far in the distance."

Regnier agreed, advising the group to have the confidence to tell their own stories. "Everyone makes mistakes, but stick to the technical fields and work hard," she said. "Tell your story as

if you had every intention to do exactly what you did because you had to go through those things to get where you are."

Mitchell enlisted in the Marine Corps 22 years ago, but when she was commissioned, it offered her a new perspective. "Whether it be in school or otherwise, don't stay locked into what you consider your specialty," she said. "Explore what everyone has to offer. You'd be surprised at how much you can learn and how much you can offer."

Hayley Oliver, a Science and Engineering Apprenticeship Program intern researching humanitarian assistance and disaster response with Dr. Susan Sanchez in the NPS Operations Research department, agreed with Mitchell. "This internship is great," she said. "A teacher referred me around the same time I'd joined the robotics team at my school. Engineering, computer science and biology have always been exciting to me. I've focused on data analysis here, and that's all new to me. I've learned a lot."

Sanchez welcomed the mentorship role with Oliver. "I think there are many situations where young women may opt out of STEM careers because they may not have made a connection with someone to encourage them to pursue these fields early on," said Sanchez. "While there still is a gender gap, we're definitely making strides. That gap is slowly closing thanks to programs like these."

During the summer of 2014, 85 students participated in eight or 10-week internships. They were matched with NPS faculty doing research focused on areas such as computer security, space systems, renewable energy, hastily formed networks and operations research.

The Naval Postgraduate School provides advanced education and research programs to the Naval Services, other Armed Forces of the U.S. and our partners, to enhance our national security. Its headquarters are located in Monterey, California.

NMRC OPENS ITS DOORS TO INTERNS

BY MIKELLE D. SMITH, NAVAL MEDICAL RESEARCH CENTER PUBLIC AFFAIRS

This summer, the Naval Medical Research Center (NMRC) hosted eight high school students in an eight-week internship Science and Engineering Apprenticeship Program (SEAP).

According to SEAP's website, "The goals of [the program] are to encourage participating students to pursue science and engineering careers ... and to make them aware of DoN [Department of the Navy] research and technology efforts, which can lead to employment within the DoN."

High school students participating in SEAP filled the halls and laboratories at NMRC, engaging in various fields of scientific study and receiving one-on-one professional guidance from volunteer mentors, all of whom are researchers at the facility.

"At first I was slightly intimidated, but over time I learned to be comfortable in the lab setting," said SEAP intern Heather Lukas, who worked in the Viral Rickettsial Department under Dr. Huan-Wei Chen. "It is very interesting to see that everyone is working on their own independent projects, and at lab meetings I am able to present what I am doing to the researchers. Dr. Chen is very professional, and he gives us freedom to do our work while making sure we are doing things correctly."

Lukas added, "At my high school, I am part of the mentorship program. I hope to continue working with Dr. Chen here at NMRC to fulfill my senior project requirements, which would allow me to continue the research I am doing now to make a well-rounded senior project."

At NMRC, mentors choose SEAP interns based on their experience level and interest in particular fields of study. In many cases, returning interns are able to work with the same mentors, continuing previous studies and engaging in new experiences. One such returning SEAP intern is Caitlin Whittier, a two-year participant.

"Last year I was a SEAP intern with OUMD [Operational Undersea Medicine Directorate] and loved the experience, so I reapplied," said Whittier, whose mentor is Dr. Michael Bodo. "This year I was able to see all aspects of my research focus [area], which I am extremely grateful for. I will be attending George Washington University as a freshman next month, and I am thankful for all the help and knowledge I've received from the researchers."

Not all SEAP interns are returning participants; some are first timers, like William Green, who simply loves the field of science and wishes to learn more about the Navy's role in research.

"I have been interested in medicine, biology and chemistry for quite a while, so I thought this would be a great opportunity to gain some experience over the summer," said Green, who is assigned to OUMD under Dr. Aaron Hall. "I would love to come back to this facility next summer and even work here in my future. I would like to major in biology and chemistry then join the Navy to go to medical school and serve as a doctor."

At the completion of the eight-week internship, students are required to submit a poster on the research they conducted during the program. This allows them to show what they have learned from their mentors, as well as share their personal experiences.



A BRIGHT FUTURE: Science and Engineering Apprenticeship Program intern Heather Lukas, right, shares her research poster with Naval Medical Research Center's (NMRC) Lt. Cmdr. Maya Williams, left, during a poster presentation session. (Photo by Mikelle D. Smith, NMRC Public Affairs)

"I hope that programs like this are around in the future for my daughter," said NMRC researcher Lt. Kimberly Edgel, deputy head of NMRC's Malaria Department and SEAP coordinator. "The role of mentorship in career development is becoming more and more prominent. These interns are very bright, and I believe the Navy views these individuals as the scientists of the future. You can never put enough emphasis on the progression of the students' education and career experiences."

Students interested in SEAP should be going into their sophomore year of high school and be 16 years of age. They also must be U.S. citizens. For more information on SEAP visit its website at <https://seap.asep.org>.

Naval Medical Research Center, headquartered in Silver Spring, Maryland, is a premier research organization that enhances the health, safety, readiness and performance of Navy and Marine Corps personnel through basic and applied biomedical research.

RECENT GRAD PROGRAM OPENS WORLD TO BUDDING ENGINEERS

BY JIM KATZAMAN, MARINE CORPS SYSTEMS COMMAND PUBLIC AFFAIRS

Barely a year out of college, Alex Solomon has traveled from coast to coast to see Marines prepare for battle. It's "almost a Marvel moment"—a comic book adventure come alive—when he sees a sketch leap off the drawing board into a warrior's hands.

Solomon is a recent engineering graduate, working in the Modeling and Simulation Division of Marine Corps Systems Command (MCSC). During his two-and-a-half-year tour he will gain firsthand experience, seeing how Marines and equipment operate and, most importantly, finding out how engineering models relate to the real world.

"Engineers can get lost in the technical world and not see how Marines actually use the equipment we designed," Solomon said. "Going out to the field—as an engineer, I loved it. You read in a textbook how things work, and you see how equipment is built from scratch. But to see it in the field—to see [the equipment] do what it was designed to do—that's a 'we got it!' moment. It worked!"

Solomon is one of a cadre of engineers in the Naval Acquisition Developmental Program, also known as NADP. The program aims to hire the best and brightest young technical minds straight out of college and set them on a path to be the experienced engineers the Marine Corps needs in the future.

Originally from West Palm Beach, Florida, Solomon graduated in 2013 from the University of Florida with a bachelor's

degree in aerospace engineering and arrived at MCSC Jan. 13, 2014, for his multi-year developmental tour. After his first year he can go on three-month rotations outside the command. For instance, in March 2015 he will be doing a rotation to the Dam Neck Fleet Training Center in Norfolk, Virginia, which supports the Center for Surface Combat Systems headquartered in Dahlgren, Virginia. This rotation would help him see realistic combat training.

He already has taken to the field to see the operating forces in action. One trip took him to the Marine Corps Air Ground Combat Center, also known as Twentynine Palms, California, to see the Marine Expeditionary Brigade.

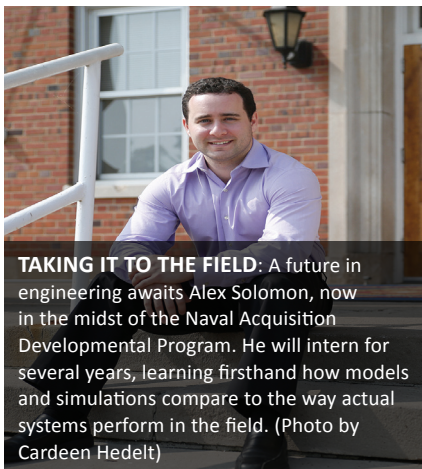
"In the recent graduate program, we have an opportunity to get out with the Marines," he said. "I got out to Camp Pendleton [California] to watch H-1 [helicopters] fly around and see vehicles drive by. That's definitely not what I expected. It's better."

Once in the program, the rewards rest largely on an engineer's wherewithal and ambition, especially during the three-month job rotations. "It's up to the recent graduates to look for activities they can get the most out of for three months," Solomon said.

Flexibility throughout the NADP is crucial for success, he explained.

"You can choose to sit behind a desk or be outside all day," Solomon said. "You can work as an individual or collectively as a group. Ultimately, I'm looking to take as much out of the recent graduate program as possible to enhance my career."

To find out more about the NADP program, please visit <http://www.secnv.navy.mil/rda/workforce/Pages/NADP.aspx>.



TAKING IT TO THE FIELD: A future in engineering awaits Alex Solomon, now in the midst of the Naval Acquisition Developmental Program. He will intern for several years, learning firsthand how models and simulations compare to the way actual systems perform in the field. (Photo by Cardeen Hedelt)

Marine Corps Systems Command, headquartered in Quantico, Virginia, serves as the Department of the Navy's systems command for Marine Corps ground weapons and information technology systems.

SUPER-COMPUTING INTERNSHIP PROGRAM

BY HOLLY KELLOGG, NAVAL AIR SYSTEMS COMMAND

The Educational Outreach Office at Patuxent River Naval Air Station collaborated with the DoD High Performance Computing Modernization Program Office (HPCMPO) to provide an innovative internship program for high school youth during the summer 2014. The HPCMP Workforce Development Office provided funding to hire four college computer science interns to train 30 high school students from seven different schools and provided four mini-supercomputer kits. The five-week program enabled the high school students to learn how to program in C++ and to assemble multiple mini super computers. For many students, this was their first venture into computer programming. The students also researched a case study, wrote detailed papers, created posters on their research topics, and gave outbrief presentations to school officials and base leadership.

There are plans to continue this effort in 2015 and to offer several one-day programming workshops utilizing microprocessors to middle and high school students from the National Society of Black Engineers Jr. and local girls programs. This will be followed up with a three-to-five-day Programming Bootcamp. This effort will be to train those students 16 and older to program at the intermediate level so they can participate in next year's internship program and advance further into parallel processing. The HPCMPO is interested in replicating this initiative across the country.

PROMOTING NAVAL INTERNSHIPS AND FELLOWSHIPS

BY WILLIAM H. ELLIS JR., OFFICE OF NAVAL RESEARCH



While students may gain great theoretical knowledge in college, interning is an excellent way to gain real-world, on-the-job experience. An internship also weighs favorably on one's chances of gaining post-college employment. The

Department of the Navy's internship and sabbatical programs include a wide variety of opportunities for students and faculty. While internships offer students the opportunity to engage in naval science and engineering efforts, the sabbatical and summer faculty programs provide accepted fellows a foundation for future research collaborations, as well as an engaging hands-on experience at naval labs.

As acting program manager for Historically Black Colleges and Universities and Minority Institutions (HBCU/MI), one of my first priorities was to promote awareness of the breadth and value of the internship, fellowship and sabbatical programs at naval labs. These opportunities enhance what participants learn in school and promote a better understanding of what the Navy and Marine Corps have to offer in terms of civilian and enlisted workforce opportunities. In particular, I emphasized the impact of engaging one-on-one with naval mentors during participation in these programs.

Naval interns and fellows are paired with mentors as soon as they arrive at their assigned naval labs. This relationship is a vital part of these programs, especially in the case of undergraduate and graduate students. Mentors are typically some of the first people whom interns interact with at their labs. These mentors support interns throughout their technical endeavors and assist them in acclimating to the environment.

The impact of this relationship cannot be understated, and the network that mentors open can lead to full-time employment for the protégés. It is always gratifying to meet naval lab employees who share that their first job experience was a naval internship that positively shaped and led to a satisfying career.

BEST PRACTICES FOR STEM OUTREACH: A WORKSHOP FOR NAVAL SCIENTISTS AND ENGINEERS

BY SARAH DURKIN, UNITED STATES NAVAL ACADEMY

Interest in STEM outreach comes from the heart for naval scientists and engineers—as was apparent during the Best Practices for STEM Outreach Workshop, hosted by the United States Naval Academy (USNA) and sponsored by the Office of Naval Research (ONR). More than 30 STEM program coordinators from naval commands around the nation joined together in Annapolis, Maryland, on Sept. 26-27, to share knowledge and resources for successful implementation of STEM outreach activities and programs.

Discussions focused on a range of topics, including sustainability; partnerships; volunteers; assessment methods; venues; and outreach methods. These discussions were led by STEM leaders from across the commands including: myself; James Rohr of Space and Naval Warfare Systems Center Pacific; Toby Ratcliffe of Naval Surface Warfare Center Carderock Division West Bethesda; Joe Calantoni of Naval Research Lab Stennis; and Gaetan Mangano of Naval Air Warfare Center Aircraft Division.

The workshop embodied a collaborative spirit for the naval STEM outreach community. “The depth and breadth of experience brought thoughtfully to bear on

naval STEM interests was clearly evident,” said Craig Hughes, ONR deputy director of research and acting director of education and workforce. “The open conversation, positive time together and expressed commitments to continue the involvements bode very well for our future work to strengthen STEM capabilities in the DoN [Department of the Navy] and the nation.”

Attendees participated in hands-on educational modules focused on project-based learning methodology, Navy-relevant curriculum and practical take-away activities. Modules covered a broad range of topics, including corrosion, helicopters, fluids and cryptography. Engineering design expertise was honed in a friendly competition—“Spuds in Subs”—where teams were challenged to create a potato submarine. Short, portable activities were showcased in a “land, air and sea” activities fair, where attendees also received curriculum and materials to replicate many activities at their own commands.



SPUD SUBS: Naval scientists and engineers have fun during the engineering design challenge at the Best Practices in STEM Outreach Workshop. (Photo by USNA STEM Office)

SUMMER INTERNSHIPS AT SSC PACIFIC

BY SPACE AND NAVAL WARFARE SYSTEMS CENTER PACIFIC

CONTRIBUTING AUTHORS: KATHLEEN GATELY, NICK KAMIN, MONICA UMEDA AND MAURICE CIVERS

The Space and Naval Warfare Systems Center Pacific (SSC Pacific) hosted 83 students this summer in California, Hawaii and Pennsylvania, giving them hands-on experience in a naval lab environment. As part of the Science and Engineering Apprenticeship Program (SEAP) and Naval Research Enterprise Internship Program (NREIP), these students spent eight- or 10-week sessions working side-by-side with scientists and engineers learning and engaging in a variety of STEM disciplines while being introduced to the dynamic careers the Navy has to offer.

SSC Pacific's continued engagement in these programs is a direct testament to the value these summer interns provide to the labs. Year after year, the employees, mentors and leaders work hard to ensure that they can continue to provide these opportunities to deserving up-and-coming students.

SAN DIEGO, CALIFORNIA – INCREASING INTERN ENGAGEMENT

After students spent weeks working on projects with their mentors, the culmination of their efforts resulted in two poster sessions, held in July and August, where students presented their technical work. Twenty-four students presented during July's session, while August's session was the largest ever with 54 high school and college students presenting their work.

"Each year I am amazed at the caliber of students who choose to spend their summers with us," said Kathleen Gately, SSC Pacific lab coordinator for summer internships and fellowships. "Our organization works hard to provide our interns with an environment that will foster their creativity, help them develop a problem-solving mindset and give them the chance to participate in meaningful technical

research. Additionally, the enrichment activities built into our summer program encourages interns to build their skills, as well as a sense of purpose and community. Summer interns have the option to participate in field trips, ship tours, MATLAB courses, professional etiquette and team-building seminars and/or volunteer at the RoboSub competition. SSC Pacific is hard at work building the next generation of exceptional scientist and engineers."

HONOLULU, HAWAII – CREATING A STUDENT PIPELINE

Tyler, a 2014 NREIP intern, first became involved with SSC Pacific in 2011 while participating in a robotics club and competition. During his internship, he learned firsthand what it's like to work as a STEM professional. Tyler planned to

major in English prior to this engagement, but following his experience in the robotics club and interactions with SSC Pacific mentors, Tyler was introduced to a variety of different skill sets and set a new goal to pursue a degree in computer engineering.

“SSC Pacific is hard at work building the next generation of exceptional scientists and engineers.”

Kathleen Gately, SSC Pacific lab coordinator for summer internships and fellowships

PHILADELPHIA, PENNSYLVANIA – HERE'S TO GREAT BEGINNINGS

2014 marked the first year that SSC Pacific opened its internship doors at our remote site in Philadelphia. Along with piloting both SEAP and NREIP in 2014, SSC Pacific Philadelphia partnered with Naval Surface Warfare Center, Carderock Division's Ship System Engineering Station (NSWC SSES) for an event that worked to increase intern exposure to the dynamics of engineering and potential civilian careers in the Navy, while providing an opportunity for the interns to mentor younger students aspiring to become summer interns and future engineers themselves.

Participating interns were special guests of NSWC SSES and had the opportunity to meet with the organization's commanding officer, speak with Navy subject-matter experts and tour the facility. They also were recognized as "Near Peer Ambassadors," mentoring fifth, sixth and seventh grade students while working alongside a panel of Navy engineers as guest judges in a middle school undersea robotics competition and poster session.



INVESTING IN OUR FUTURE: Visitors and employees mingle among the 54 posters representing the technical subjects the summer interns participated in during their summer internship program. (Photo by Norman Tancioco, Space and Naval Warfare Systems Center Pacific)

AROUND THE NAVY: A SUMMER WRAP-UP

Sailors, Marines and students were busy this summer! Below is a sampling of stories from across the Navy and Marine Corps that highlight the activities of commands from coast-to-coast.



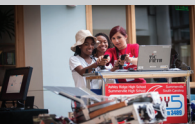
GRAND ROBOTICS MISSION: Ninety-three students applied their STEM skills during the Grand Robotics Mission Challenge. To read more, visit http://www.navy.mil/submit/display.asp?story_id=82115.

Photo: A middle school student uses remote-controlled models to solve simulated naval robotic missions. (U.S. Navy photo)



QUANTICO STEM ACADEMY: STEM professionals brought activities and experiences to more than 50 young people at the Quantico Middle-High School STEM Academy. For more information, visit http://www.navsea.navy.mil/nswc/dahlgren/NEWS/Quantico_STEM_Academy_2014/Quantico_STEM_Academy_2014.aspx.

Photo: A junior mentor helps a student with her robot. (Photo by Andrew Revelos)



SPAWAR INSPIRES GIRLS: SSC Atlantic partnered with local colleges to get girls excited about STEM. To read more, visit http://www.navy.mil/submit/display.asp?story_id=82438.

Photo: Teens learn how to operate robots at the 2014 Girls Day Out Summer Camp (Photo by Joseph J. Bullinger III)



ROCKETS, ROBOTS & ROTOCOPTERS: Triple R's invaded Marine Corps Tactical Systems Support Activity during its STEM summer camp. To read more, visit <http://www.marcorsyscom.marines.mil/Portals/105/MCTSSA/Newsletter/2nd%20Qtr%202014%20MCTSSA%20Newsletter.pdf>.

Photo: Students participating in MCTSSA's summer camp fire off water rockets. (Photo by Wil Williams)



USNA HOSTS THREE SUMMER CAMPS: To read more about USNA's various summer camps, please visit:

Summer STEM Program: <http://www.usna.edu/STEM/news/2014-07-24-stem-camp.php>

Girls Technology Camp: <http://www.usna.edu/STEM/news/2014-07-25-girls-tech-camp.php>

SET Sail: <http://www.usna.edu/STEM/news/2014-07-26-set-sail-summer-2014.php>

Photo: Middle school girls solder blinky robots at the Girls Technology Camp. (Photo by USNA STEM Office)



SUPPORTING STEM AT DEOMI: Defense Equal Opportunity Management Institute engaged in its first student STEM program this summer. For more information, visit http://deomi.org/downloadableFiles/Reflections_Spring_and_Summer_2014_Issue.pdf

Photo: Members of the Defense Equal Opportunity Management Institute's command leadership team pose with 2014 STEM students. (Photo by SFC Jennifer Harper)

LOOKING AHEAD:

Learn more about the naval STEM community in the special edition, slated to come out January 2015.

UPCOMING STEM DATES

Online applications close for several Navy internship and scholarship programs:

Dec. 15 - **Science, Mathematics & Research for Transformation (SMART):**

<https://smart.asee.org/apply>

Dec. 19 - **Science and Engineering Apprenticeship Program (SEAP):**

seap.asee.org/apply

Dec. 19 - **Naval Research Enterprise Internship Program (NREIP):**

nreip.asee.org/apply

Attend the special STEM session at the Naval Future Force S&T Expo on

Feb. 4-5, 2015

NAVAL STEM WEBSITES AND SPONSORED ACTIVITIES

Below is a list of websites you may find interesting. It includes Web addresses for various naval programs, as well as some of our signature program partners.

www.usna.edu/STEM

www.ndep.us

seap.asee.org

nreip.asee.org

smart.asee.org

www.dodstarbase.org

ABOUT STEM2STERN

STEM2Stern is the Department of the Navy's science, technology, engineering and mathematics (STEM) Initiative. Under the leadership of the chief of naval research, who serves as the naval STEM executive, STEM2Stern works with the naval system commands, laboratories, warfare centers and other research and education institutions to leverage resources and maximize the impact of the department's STEM investments.

These investments support a wide variety of STEM educational programs, ranging from activities designed to spark younger students' interest in STEM careers, to more in-depth, hands-on learning opportunities for middle and high school students, internships and research fellowships for older high school and post-secondary students and professional development opportunities for naval STEM professionals and faculty.

Please visit **STEM2Stern.org** for more information about naval STEM, or contact the STEM2Stern office at **STEM2Stern@navy.mil**.

